

**SUPERCRITICAL COMPOSITIONS FOR REMOVAL  
OF ORGANIC MATERIAL AND METHODS OF USING SAME**

**Abstract of the Disclosure**

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**F1**  
A method for removing organic material in the fabrication of structures includes providing a substrate assembly having an exposed organic material and removing at least a portion of the exposed organic material using a composition having at least one component in a supercritical state. The composition includes an oxidizer selected from the group of sulfur trioxide (SO<sub>3</sub>), sulfur dioxide (SO<sub>2</sub>),  
10 nitrous oxide (N<sub>2</sub>O), NO, NO<sub>2</sub>, ozone (O<sub>3</sub>), hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), F<sub>2</sub>, Cl<sub>2</sub>, Br<sub>2</sub>, and oxygen (O<sub>2</sub>). For example, the exposed organic material may be selected from the group of resist material, photoresist residue, UV-hardened resist, X-ray hardened resist, carbon-fluorine containing polymers, plasma etch residues, and organic impurities from other processes. The at least one component in a supercritical state  
15 may be an oxidizer selected from the group of sulfur trioxide (SO<sub>3</sub>), sulfur dioxide (SO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), NO, NO<sub>2</sub>, ozone (O<sub>3</sub>), hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>), F<sub>2</sub>, Cl<sub>2</sub>, Br<sub>2</sub>, and oxygen (O<sub>2</sub>); preferably sulfur trioxide. Further, the composition may include a supercritical component in a supercritical state selected from the group of carbon dioxide (CO<sub>2</sub>), ammonia (NH<sub>3</sub>), H<sub>2</sub>O, nitrous oxide (N<sub>2</sub>O), carbon monoxide  
20 (CO), inert gases (e.g., nitrogen (N<sub>2</sub>), helium (He), neon (Ne), argon (Ar), krypton (Kr), and xenon (Xe); preferably carbon dioxide. Further, organic material removal compositions for performing such methods are provided.

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PRINTED NAME

SIGNATURE

Jill R. Price  
JILL R. PRICE